

Patent Abstracts of Japan

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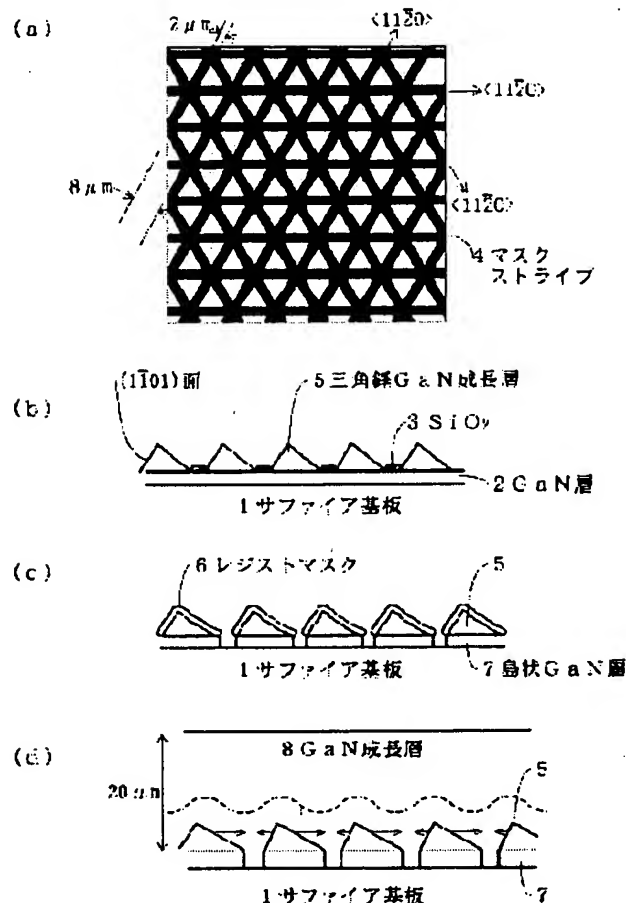
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APPLICANT : NIPPON TELEGR & TELEPH CORP
<NTT>;

INVENTOR : KOBAYASHI YASUYUKI;

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TITLE : NITRIDE SEMICONDUCTOR
SUBSTRATE AND ITS
MANUFACTURING METHOD



ABSTRACT : PROBLEM TO BE SOLVED: To provide a nitride semiconductor substrate and its manufacturing method that has uniformly low dislocation density over the entire surface of the substrate.

SOLUTION: A GaN layer 2 is provided on a sapphire substrate 1. On the GaN layer 2, a mask stripe 4 that is composed of a line of 2 μm and a space of 8 μm is formed in three equivalent $\langle 1120 \rangle$ directions of SiO_2 so that an opening part becomes an equilateral triangle. At the equilateral triangular opening by the mask stripe 4, GaN is grown for forming a trigonal pyramid GaN growth layer 5. A resist mask 6 is formed on the trigonal pyramid GaN growth layer 5, the mask stripe 4 and the GaN layer 2 under the mask striped 4 are removed, and the resist mask 6 is removed for forming an inland-shaped GaN layer 7. When a GaN growth layer 8 is grown on the entire surface of the sapphire substrate 1, crosswise growth is promoted so that the trigonal pyramid is buried. When the GaN growth layer 8 is grown by approximately 20 μm , flatness is achieved. When dislocation that is vertically extended from a substrate interface reaches the slant of pyramid structure, it does not reach a bending surface, thus achieving the low dislocation density.

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